Hardie, J., Nottingham, S.F., Powell, W. & Wadhams, L.J., 1991. Synthetic sex pheromone lures female parasitoids. *Entomologia experimentalis at applicata* **61:** 97-99.

Hardie, J., Pickett, J.A., Pow, E.M. & Smiley, D.W.M., 1999. Aphids *in* Hardie J. & Minks, A.K. (eds) *Pheromones of Non-Lepidopteran Insects*. pp. 227-250 CABI Publishing, Wallingford .

Hollier, J.A. & Belshaw, R.D., 1992 Changes in Neuroptera assemblages in an old field succession in Southern Britain. *The Entomologist* **111**: 187-194.

– , 1993. Stratification and phenology of a woodland Neuroptera assemblage. *The Entomologist* **112:** 169-175.

Lacroix, J.-L., 1920. Faune névroptérique de l'Algérie et de la Tunisie. II (1) Chrysopide nouveau. *Bulletin de la Société d'Histoire Naturelle de l'Afrique du Nord* **11:** 83-84.

Monserrat, V.J. & Marin F. 1994. Plant substrate specificity of Iberian Chrysopidae. *Acta Oecologica* **15:** 119-131.

Parmesan, C., Ryrholm, N., Stefanescu, C., Hill, J.K., Thomas, C.D., Descimon, H., Huntley, B., Kaila L., Kullberg, J., Tammaru, T., Tennent, W.J., Thomas, J.A. & Warren, M., 1999. Poleward shifts in geographical ranges of butterfly species associated with regional warming. *Nature* **399**: 579-583.

Plant, C.W. 1997. A key to the adults of the British lacewings and their allies (Neuroptera, Megaloptera, Raphidioptera and Mecoptera). *Field Studies* **9:** 179-269.

Zelený, J., 1984. Chrysopid occurrence in west palearctic temperate forests and derived biotopes *in* Canard, M., Séméria, Y. & New, T.R. (eds) *Biology of Chrysopidae* pp. 151-160. Junk, The Hague.

Parasitoid *Meteorus gyrator* (Thunb.) (Hym.: Braconidae: Meteorinae) reared from larva of the White-spotted Pinion moth *Cosmia diffinis* (L.)(Lep.: Noctuidae) in Cambridgeshire

On 28 May 2000, I found an early instar larva of the White-spotted Pinion moth *Cosmia diffinis* about 1 cm in length, while searching for spinnings of this species among the leaves of epicormic growth in a stand of tall roadside elms *Ulmus* sp.. The trees were bordering a cattle field at Boxworth, Cambridgeshire, a site reported to me by John Chainey. The larva was just above head height, but within reach of the ground and the spinning was discovered by looking up into leaves at this height. The elms form a shelterbelt several trees deep and the larva was on a tree in the centre of the shelterbelt in only dappled sunlight, not on the edge of the stand (Plate I, Fig. 1). During an hour spent beating and searching with Rachel Thomas and David Hastings, this was the only larva of *C. diffinis* found. I looked forward to rearing the larva to adult to confirm its identity and to studying its feeding and spinning behaviour. However, only a few days later, on 6 June 2000, a single grub of a parasitic wasp emerged from the small larva and spun a cocoon attached to an elm leaf by the corpse of its host.

I determined the young larva as of *C. diffinis* and not *C. affinis* on the basis that its black head does not show a trace of green, that it does not have a black thoracic plate, it has the pale translucent body colour and the details of the

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Plate I. Parasitoid of *Cosmia diffinis* (L.). 1. The elm trees from which the larva was beaten; 2. The early instar larva of *Cosmia diffinis,* parasitised by *Meteorus gyrator*; 3. *Meteorus gyrator,* its cocoon and the remains of the host larva (scale rule is millimetres).

stripes match. It is in fact an exact match to the form illustrated by Spuler (1904. *Die raupen der schmetterling Europus*. Reprint edition, 1989. Apollo. Svendborg), who seems to have illustrated the penultimate instar. Readers may be aware that the early instars of these two *Cosmia* species differ markedly from the final instar which is so often illustrated in the standard text books (e.g. Porter, 1997. *The colour identification guide to caterpillars of the British Isles*. Viking, London). For example, both species have more prominent black warts in the earlier instars. In *C. diffinis* the head capsule of the final instar is reddish brown, in *C. affinis* it is green, but it is black in the earlier instars of both species, though usually there is a hint of green in *C. affinis* (a distinguishing feature pointed out to me by John Chainey). Plate I, Fig. 2 is provided as a permanent record of the appearance of this particular host larva.

The adult wasp emerged some time later in the summer, when it was discovered dead in the rearing box. Plate I, Fig. 3 shows the wasp, its cocoon and the corpse of the larva next to a ruler graduated in millimetres for scale. These remains were sent to Dr Mark Shaw (National Museums of Scotland, Edinburgh) who identified the parasitoid as a male of the brachonid wasp *Meteorus gyrator* (Thunberg). Dr Shaw informs me that this is a common species with a wide range of recorded hosts. It appears to select noctuids which feed externally on the foliage of trees and shrubs and has also been recorded from hosts which feed on the aerial parts of grasses and other low plants. Dr Shaw reports specimens in the collections reared from the Dunbar *Cosmia trapezina*, Red-line Quaker *Agrochola lota*, Minor Shoulder-knot *Brachylomia viminalis*, Square-spot Rustic *Xestia xanthographa*, Antler *Cerapteryx graminis*, Straw Underwing *Thalpophila matura*, Bright-line Brown-eye *Lacanobia oleracea*, Small Angle Shades *Euplexia lucipara* and a probable *Mythimna* species. In cases such as these, where parasitoids may exist at high density on host species which are numerous, such as *C. trapezina*, the impact on rare species which are also susceptible in the same habitat could be considerable. As if *C. diffinis* did not have enough to contend with as a result of Dutch elm disease and the possible requirements of the moth for quite mature elms (see Waring, 2000. In the field: Searching for White-spotted Pinion *Cosmia diffinis* (Linn.). *Atropos* **10**: 5-9 and references there cited), it seems that parasitoids are another factor which need to be considered. Furthermore, braconid wasps are not the only parasitoids impacting on numbers of *C. diffinis*. John Chainey reared three *C. diffinis* larvae also collected from Boxworth in May 2000 and one of these produced a single tachinid fly. This has been identified by Nigel Wyatt at the Natural History Museum, London, as *Eumea linearicornis* (Zett.), a widespread species in southern Britain north to the Midlands and Wales. This fly has been reported from the Lunar-spotted Pinion *Cosmia pyralina* as well as from a number of other noctuid moths and also from some tortricoids and pyralids. We are most grateful to Nigel for this determination and information.

One presumes that these parasitoids were always present, but whether their impact is sufficient to contribute to local extinctions now that *C. diffinis* is much rarer and more localised is completely unknown.

I thank all the above named for their help with this observation, which took place as part of the UK Biodiversity Action Plan Project on this moth, administered by Butterfly Conservation and funded by English Nature.– PAUL WARING, 1366 Lincoln Road, Werrington, Peterborough PE4 6LS.

Hazards of butterfly collecting:
A military escort will be needed – Oman 1979

Back in October 1979, I was in the southern Province of Dhofar in the Sultanate of Oman to study and photograph butterflies for a small book on the *Butterflies of Oman* (Larsen, T. & Larsen, K., 1980. Bartholomew Books). I was an official invitee of Sultan Qaboos, who was devoted to the conservation and documentation of the rich natural and cultural heritage of Oman. I had my own Land Rover from the Royal Stables. I was staying in the Royal Guest House in Salalah, which differed from a luxury hotel only in that no money was involved. The Indian staff wanted to please you so that they could keep their jobs for as long as possible; tips and such like were deeply secondary to good references. All hotels should be like that.

There are not that many butterflies in Dhofar (about 50 species), but they are very interesting. Like in Yemen, there is a monsoon climate, which yields a profuse rainfall during the rainy season that much surpasses that of the rest of the Arabian Peninsula. The steep coastal scarp rises some 200 metres straight from the sea and has an Afrotropical flora, an impoverished version of what you might find in parts of Ethiopia. This was reflected in the butterfly fauna, which included many Afrotropical species that went no further west than Dhofar; there are even two species of *Charaxes*, both with subspecies endemic to Dhofar.

Though most of the species were very interesting, there were not that many, and I felt that I should collect other groups as well. I did a lot of moth trapping with great success: 22 species of macro-moths new to science, a dozen new beetles, and two Neuroptera have been described to my knowledge, but there might be many more.

I also had dragonflies high on my list of priorities, thanks to a request by Dr A. R. Waterston, so a visit to the Darbat Pools seemed called for. I had seen photos of them; the largest expanses of freshwater in Arabia set in an emerald green valley of the utmost beauty. It should be good for butterflies as well.

There was a botanist from Edinburgh in Dhofar, who did not have my privileges, so I asked him to come along, since it should be good for plants as well. He was delighted. The problem was that there were still residual rebel